

I claim:

1. A craniomaxillofacial distraction device comprising:

head mounting means for securing said device to the head of a patient in a fixed manner,  
said head mounting means comprising a helmet, wherein said helmet distributes compressive  
5 forces such that localized pressure points are avoided;

support means for receiving distraction means, said support means being connected to  
said head mounting means; and

distraction means for applying distracting forces to treat craniofacial anomalies, said  
distraction means being mounted onto said support means.

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2. The device of claim 1, wherein said support means comprises a generally vertically  
oriented support rod member.

3. The device of claim 2, wherein said support means further comprises an anterior  
15 mounting member secured to said helmet.

4. The device of claim 3, wherein said support means further comprises a mounting stem  
extending from said anterior mounting member, said support rod member being connected to  
said mounting stem.

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5. The device of claim 2, wherein said support means further comprises a crossbar assembly  
comprising a generally horizontally disposed crossbar rod member.

6. The device of claim 5, wherein said crossbar assembly is adjustable relative to said support rod member.

7. The device of claim 1, wherein said helmet is composed of a polymer material.

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8. The device of claim 1, wherein said helmet is custom fitted to correspond directly to the head of said patient.

9. The device of claim 1, wherein said helmet is open on the top.

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10. The device of claim 1, wherein said helmet comprises adjustment means for altering the configuration of said helmet.

11. The device of claim 10, wherein said adjustment means comprises a generally vertical slit defining ends on said helmet, and closure means for securing said ends.

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12. The device of claim 10, wherein said adjustment means comprises an internally disposed compressible liner.

13. The device of claim 10, wherein said adjustment means comprises inflatable bladders.

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14. The device of claim 10, wherein said adjustment means comprises internally disposed shaping members.

15. The device of claim 1, wherein said helmet comprises a chin member.

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16. The device of claim 1, wherein said distraction means comprises a pair of distraction assemblies each comprising a threaded distraction screw, a spindle housing to receive said distraction screw, and a bone attachment means.

10 17. The device of claim 16, wherein said bone attachment means comprises a bone plate.

18. The device of claim 16, wherein said bone attachment means comprises a bone screw.

19. The device of claim 16, wherein said bone attachment means comprises an intraoral wire.

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20. The device of claim 1, wherein said support means comprises a temporal mounting member secured directly to said helmet.

21. The device of claim 20, wherein said support means further comprises a non-vertically oriented support rod member connected to said temporal mounting member.

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22. The device of claim 21, wherein said support means further comprises temporal orientation means, such that the orientation of said non-vertically oriented support rod member is adjustable relative to said head mounting means.

5 23. The device of claim 21, wherein said temporal orientation means comprises a rotating plate member pivotally attached to said temporal mounting member and wherein said non-vertically oriented support rod member is connected to said temporal mounting member through said rotating plate member.

10 23. The device of claim 2, wherein said support means further comprises multi-directional orientation means, such that the orientation of said vertically oriented support rod member is adjustable relative to said head mounting means.

24. The device of claim 23, wherein said multi-directional orientation means comprises a  
15 universal joint.

25. A craniomaxillofacial distraction device for treating craniofacial anomalies in the jaw of a patient comprising:

head mounting means for securing said device to the head of the patient in a relatively  
20 fixed manner wherein relative motion between said helmet and the head of the patient is limited, said head mounting means comprising a helmet, wherein said helmet distributes compressive forces such that localized pressure points are avoided;

support means for receiving distraction means, said support means being connected to said head mounting means;

distraction means for applying distraction forces to the jaw of the patient, said distraction means being mounted onto said support means and comprising at least a pair of distraction  
5 assemblies connected to the jaw of said patient.

26. The device of claim 25, wherein said support means comprises a generally vertically oriented support rod member and a generally horizontally oriented crossbar rod member.

10 27. The device of claim 26, wherein said support means further comprises an anterior mounting member secured directly to said helmet and a mounting stem extending from said anterior mounting member, said support rod member being connected to said mounting stem.

28. The device of claim 26, wherein said crossbar rod member is adjustable relative to said  
15 support rod member.

29. The device of claim 25, wherein said helmet is composed of a polymer material.

30. The device of claim 25, wherein said helmet is custom fitted to correspond directly to the  
20 head of said patient.

31. The device of claim 25, wherein said helmet is open on the top.

32. The device of claim 25, wherein said helmet comprises adjustment means for altering the configuration of said helmet.

5 33. The device of claim 32, wherein said adjustment means comprises a generally vertical slit defining ends on said helmet, and closure means for securing said ends.

34. The device of claim 32, wherein said adjustment means comprises an internally disposed compressible liner.

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35. The device of claim 32, wherein said adjustment means comprises inflatable bladders.

36. The device of claim 32, wherein said adjustment means comprises internally disposed shaping members.

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37. The device of claim 25, wherein said distraction means comprises a pair of distraction assemblies each comprising a threaded distraction screw, a spindle housing to receive said distraction screw, and a bone attachment means for connecting said distraction screw to the jaw of the patient.

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38. The device of claim 37, wherein said bone attachment means comprises a bone plate.

39. The device of claim 37, wherein said bone attachment means comprises a bone screw.
40. The device of claim 37, wherein said bone attachment means comprises an intraoral wire.
- 5 41. The device of claim 26, wherein said support means comprises multi-directional orientation means, such that the orientation of said vertically oriented support rod member relative to said head mounting means may be altered.
42. The device of claim 41, wherein said multi-directional orientation means comprises a  
10 universal joint.
43. The device of claim 25, wherein said support means comprises at least one temporal mounting member secured directly to said helmet.
- 15 44. The device of claim 43, wherein said support means further comprises a non-vertically oriented support rod member connected to said at least one temporal mounting member.
45. The device of claim 44, wherein said support means further comprises temporal orientation means, such that the orientation of said non-vertically oriented support rod member is  
20 adjustable relative to said head mounting means.

46. The device of claim 45, wherein said temporal orientation means comprises a rotating plate member pivotally attached to said at least one temporal mounting member.

47. A craniomaxillofacial distraction device for treating craniofacial anomalies in the jaw of  
5 a patient comprising:

head mounting means for securing said device to the head of the patient in a generally fixed manner wherein relative motion between said helmet and the head of the patient is limited, said head mounting means comprising a helmet, wherein said helmet distributes compressive forces such that localized pressure points are avoided, wherein said helmet is composed of a  
10 polymer material and comprising adjustment means for altering the configuration of said helmet;

support means for receiving distraction means, said support means being connected to said head mounting means; and

distraction means for applying distraction forces to the jaw of the patient, said distraction means being mounted onto said support means and comprising at least a pair of distraction  
15 assemblies connected to the jaw of said patient, said distraction assemblies each comprising a threaded distraction screw, a spindle housing to receive said distraction screw, and a bone attachment means for connecting said distraction screw to the jaw of the patient.

48. The device of claim 47, wherein said support means comprises a generally vertically  
20 oriented support rod member, a generally horizontally disposed crossbar rod member mounted to said vertically oriented support rod member, an anterior mounting member secured directly to said helmet and a mounting stem extending from said anterior mounting member, said support



rod member being connected to said mounting stem, wherein said crossbar rod member is adjustable relative to said support rod member.

49. The device of claim 48, wherein said support means further comprises multi-directional orientation means such that the orientation of said vertically oriented support rod member is adjustable relative to said head mounting means.

50. The device of claim 47, wherein said support means comprises a temporal mounting member secured directly to said helmet and a non-vertically oriented support rod member connected to said temporal mounting member.

51. The device of claim 50, wherein said support means further comprises temporal orientation means, such that the orientation of said non-vertically oriented support rod member is adjustable relative to said head mounting means.